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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,090	03/16/2001	Kevin G. Owens	66034-008-2	5535

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EXAMINER

WELLS, NIKITA

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/809,090

Applicant(s)

OWENS ET AL.

Examiner

Nikita Wells

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 12 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-27 is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 11 and 12 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 and 5. 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. § 121:

I. Claims 1-10 and 13-27, drawn to a detector and method of detecting for a time-of-flight mass spectrometer, are classified in Class 250, subclass 287.

II. Claims 11 and 12, drawn to an electron multiplier having a number of selected oxide coatings, are classified in Class 313, subclass 528.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as process of manufacturing the microelectronic device and the actual use of the charged-particle-beam (CPB) microlithography apparatus for the irradiation of semiconductors. Inventions Group I and Group II are related as process of making and process of using the product. The use as claimed cannot be practiced with a materially different product. Since the product is not allowable, restriction is proper between said method of making and method of using (MPEP § 806.05(i)). Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classifications, restriction for examination purposes as indicated is proper.

3. During the telephone conversation of July 9, 2003 with Vincent T. Pace, a provisional election was made without traverse to prosecute the invention of claims 1-10 and 13-27. Claims 11-12, related to an electron multiplier having a number of selected oxide coatings, are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5, 6, 13, 14, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Blavette et al. (5,969,361).

With respect to the above claims, Blavette et al. disclose (Fig. 1; Abstract; claim 1; Col. 3, lines 28-44; Col. 4, lines 26-45) a detector for a time-of-flight mass spectrometer comprising: an electron multiplier (4), for converting a particle (2) into a multiplicity of electrons (18); and a scintillator (6), for converting the multiplicity of electrons (18) into a multiplicity of photons (20); whereby said detector is electro-optically isolated from a high voltage portion of the time-of-flight mass spectrometer.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-4, 7-10, 15-16, and 18-24, are rejected under 35 U.S.C. 103(a) as being unpatentable over Blavette et al. (5,969,361) in view of S.T. Ng (4,471,378), and further in view of Frank et al. (5,994,694) and J.G. Goodberlet (6,529,463 B1).

With respect to claims 2, 3, 16, and 18-20, while Blavette et al. disclose (Fig. 1; Abstract; claim 1; Col. 3, lines 28-44; Col. 4, lines 26-45) a detector for a time-of-flight mass spectrometer utilizing an electron multiplier (4) and a scintillator (6), Blavette et al. fail to disclose that the detector further comprises a photomultiplier for converting the multiplicity of photons into a corresponding second multiplicity of electrons which are then transformed into a charge pulse. However, S.T. Ng discloses (Figs. 1 and 3; Col. 2, lines 12-20; Col. 3, lines 53-67; Col. 4, lines 14-19) a light particle image intensifier (10) which includes a scintillator (14), photocathode (16), and multichannel plate (MCP) unit (20), which serve to convert the multiplicity of photons into a corresponding second multiplicity of electrons (22).

With respect to claims 4, 10, 15, and 24, while Blavette et al. disclose a detector for a time-of-flight mass spectrometer, Blavette et al. fail to disclose that the detector comprises a coating on the electron multiplier selected from aluminum oxide ( $\text{Al}_2\text{O}_3$ ), magnesium oxide ( $\text{MgO}$ ), tin oxide ( $\text{SnO}_2$ ), quartz ( $\text{SiO}_2$ ), barium fluoride ( $\text{BaF}_2$ ), rubidium tin ( $\text{Rb}_3\text{Sn}$ ), beryllium oxide ( $\text{BeO}$ ), diamond, or coatings of aluminum or chrome on the scintillator. These coatings are all too well known in prior art and are disclosed by Frank et al. (claims 6-8; Col. 6, lines 30-38; Col. 7, line 63 to Col. 8, line 7) in their cryogenic detectors used for high-mass time-of-flight mass spectrometers.

With respect to claims 8 and 22, while Blavette et al. disclose a detector for a time-of-flight mass spectrometer, they fail to disclose that the detector comprises a scintillator which is constructed from Bicron 418, Bicron 422b or combinations thereof. However, J.G. Goodberlet discloses (Col. 3, line 66 to Col. 4, line 9) that the detector comprises a scintillator material made of series BC-400 which is available from Bicron Industries.

Art Unit: 2881

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize and substitute the light particle image intensifier of S.T. Ng, the cryogenic detectors used for high-mass time-of-flight mass spectrometers of Frank et al., and the scintillator material made of series BC-400 of J.G. Goodberlet, into the detector for a time-of-flight mass spectrometer of Blavette et al., in order to enhance the secondary electron emission thus providing a higher sensitivity of the detector.

With respect to claims 7, 9, 21, and 23, the detector where the scintillator is configured to provide a frequency bandwidth which accommodates arrival times of the multiplicity of electrons or of reflection of the photons generated within the scintillator is inherent in the process of generating photoelectrons in a scintillator, and is well known in prior art.

*Allowable Subject Matter*

8. Claims 25-27 are allowed.

9. The following is an examiner's statement of reasons for allowance:

With respect to the independent claims 25-27, prior art fails to disclose or make obvious a detector for a time-of-flight mass spectrometer which consists of an electron multiplier, for converting particles into a multiplicity of first electrons; a scintillator, for converting the multiplicity of first electrons into a multiplicity of photons; and a photomultiplier for converting the multiplicity of photons into a second multiplicity of electrons. The sequence of having electron multiplier followed by a scintillator and then a photomultiplier for converting the photons into a second multiplicity of electrons and then detecting these electrons, is absent in prior art.

*Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. D.E. Persyk (4,454,422) discloses a radiation detector which consists of an electron multiplier, a scintillator, a photocathode, and a multichannel plate.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikita Wells whose telephone number is (703) 305-0416. The examiner can normally be reached 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Nikita Wells

Examiner, Art Unit 2881

July 16, 2003